Sustainable Civil Building Management and Engineering Journal Vol: 1, No 2, 2024, Page: 1-7

Features of the Design of Residential Buildings

Khudayberdiyev Keldiyar, Tashmatova Khosiyat*

Samarkand State Architecture and Construction University

DOI:
https://doi.org/10.47134/scbmej.v1i2.2352
*Correspondence: Tashmatova Khosiyat
Email: x.tashmatova@samdaqu.edu.uz

Received: 16-03-2024
Accepted: 01-04-2024
Published: 30-04-2024

Abstract: The article discusses each type of residential and public buildings has its own spatial planning solution, the design of which reflects a rather complex workflow. When designing multi-family residential buildings, economic factors are primarily taken into account. In particular, the construction of residential buildings in Uzbekistan has its own historical tradition. The houses were built in two versions -national and European. These houses mainly consist of houses with separate courtyards. This study employs a qualitative research approach, drawing insights from architectural literature and historical records to examine the design features of residential buildings in Uzbekistan. Data collection involves literature review, analysis of architectural plans, and examination of historical documents. The analysis reveals that the design of multi-family residential buildings is influenced by various factors, including economic considerations, cultural heritage, and historical traditions. In Uzbekistan, the architectural landscape reflects a blend of national and European styles, each with its own spatial planning solutions and design elements. Traditional houses with separate courtyards not only provide privacy and security but also contribute to the overall aesthetics of residential neighborhoods. Additionally, economic factors play a significant role in shaping the design process, with cost-effective construction methods and materials being prioritized in residential building projects.

Keywords: Residential Buildings, Architectural and Planning Solutions, Apartment Buildings, 4-5-Storey Buildings, Geographical Environment, Bukhara Houses, Houses Built in the Ferghana and Khiva Style

Introduction

After Uzbekistan gained independence, there has been a significant increase in the development process in the socio-economic sphere. As the cultural level and material well-being of the population of the republic grow, so does the demand for its activities, sports, entertainment and other institutions focused on public service (Huo, 2022; Imran, 2022; Olu-Ajayi, 2022; Wang, 2022; Xu, 2022).

Each type of residential and public buildings has its own spatial planning solution, the design of which reflects a rather complex workflow. Therefore, highly qualified architects with extensive experience are involved in the development of residential buildings, who know the specifics of the formation of architectural and planning solutions, the scale of which is formed under the influence of external natural and climatic conditions and internal complex functional and technological processes (Yan, 2022; Dolce, 2021; Krarti, 2021; Li, 2021; Wei, 2021).

Currently, low-rise and multi-storey residential buildings are being built in many urban district centers of the republic, which are provided to residents of the republic (Bertoldi, 2021; Huo, 2021, 2021; Mannan, 2021; Pauliuk, 2021). The standards of residential premises have different volumes, layout and number of floors. The correct definition of the number of floors of structures, spatial planning structure are important both from an architectural and economic point of view (Kadirova & Abdujabbarova, 2019).

The construction and design of residential buildings in accordance with the requirements of modernity allows us to solve socially significant tasks. This creates decent living conditions for people (Rosti, 2021; Zhong, 2021).

The choice of floors. The design of apartment buildings is carried out primarily taking into account economic factors. These include, in particular, the need to install elevators, garbage cans and other elements. They significantly increase the cost of designing a residential building and work on its construction. Structures up to 5 floors are not equipped with elevators, and in the northern and southern regions-up to four. In such buildings, rational walls, foundation structures, and coatings are used. 4-5-storey buildings are being built mainly in medium-sized, small, partially large cities with a population of no more than 250 thousand people, as well as in settlements with a population of 10 thousand or more people. This ensures the rational use of the territory, engineering networks, and transport (Obaydullaev & Inagamova, 2005).

Methodology

The geographical environment of the formation of any dwelling has certainly had a great impact. For example, in houses built on the north side, they tried to protect the interior of the apartments from the cold from the outside, while on the south side the opposite was required: the houses had to be protected from heat and overheating. It was also necessary to harmoniously combine the interior of the house with the external environment. Thus, on the basis of conflicting requirements, the structure (structure) of the northern and southern houses arose, completely unlike each other.

National culture and traditions have also influenced the structure and diversity of dwellings. Despite the fact that the dwellings in the south with the same climate resemble

the same thing, they changed depending on the historical culture and customs of the local residents. Therefore, the traditional settlements of the Uzbek people have adapted to their climatic conditions, level of culture and traditions and artistic traditions.

The construction of residential buildings in Uzbekistan has its own historical tradition. The houses were built in two versions -national and European. These houses were mostly houses with private courtyards. Houses adapted to the conditions of the area have been built in each region of Uzbekistan. These houses are divided into three types: Bukhara houses, Ferghana and Khiva styles. divided: Bukhara houses were very poorly developed during the feudal period and were dense buildings that were built upside down on the street, that is, in a courtyard separated from the street, the rooms were one- or two-story, densely built around the courtyard, and thus much better and cooler climatic conditions were created in the courtyard conditions are better than in the hot and dusty air of the street. (Abdujabbarova, 2018).

Khiva houses are also built in the form of a closed spatial environment, that is, around a courtyard, its difference from houses in Bukhara is that in its history. There are two different porches here. These verandas were located opposite each other, and the porch facing north was higher, and in summer the wind blowing from the north was directed into the courtyard, creating cool air in the courtyards. On the other hand, Ferghana houses originated in the picturesque valleys of Ferghana and acquired a closed character. In its historical solution, it did not have a courtyard and was oriented to the gardens through the porch. In the Ferghana Valley, the porch served as the main room during the summer months. In the Ferghana Valley and Tashkent region, the verandas were glazed, and verandas of this type were called the exterior, and residents lived on this veranda all year round.

Result and Discussion

The requirements that must be taken into account when choosing housing and apartments are as follows:

- demographic composition of the population;
- customs and crafts of family members;
- construction site;
- natural climatic conditions of the construction site;
- equipment-the condition and conditions of the construction base.

When choosing housing for each city, region, district and village, different quantitative ratios of the population living in them are taken, depending on its demographic composition. The demographic composition of the population of our republic, of course, differs from the indicators of other countries. The annual population growth in Uzbekistan is 3%.. Large families are especially common among the rural population (Abdiyev & Tashmatova, 2022).

A) dwellings, depending on the method of settlement, are divided into two groups divided into:

1. Living quarters divided into apartments, which will be designed to accommodate families in separate apartments.

2. On the other hand, living quarters divided into rooms are mainly designed to accommodate single people in separate rooms using common household services. These dormitories are home to single workers, students, students of vocational schools and boarding schools. In addition, aliens, travelers and vacationers live in hotels and holiday homes. The buildings belonging to the two groups have similarities in their architectural and historical features, which are characterized by the similarity of their functions, functions, as well as the uniformity of the requirements of the residents. The most common multi-apartment residential buildings make up the main housing stock of cities and villages (Sidikovna & Erkinovna, 2023; Sidykovna, 2023; Yuldasheva & Kamilova, 2023; Abdiyev, 2022).

Figure 1. Room layout

Depending on the method of land use, apartment buildings are divided into:

1. In residential buildings with a courtyard, the owner of the house or apartment is also the owner of the courtyard of the house. Residential buildings with courtyards can be single-family and with adjacent courtyards, that is, with two or more apartments, and each apartment has a separate courtyard.
2. Residential buildings with a common ground level are residential buildings that are being built in cities of a common communal type, both multi-apartment and predominantly multi-storey. The ground level is used by all households or those who live in a group of households. This type includes houses with a room-by-room division (Sidikovna & Erkinovna, 2023; Abdiyev, 2022).

Conclusion

According to the number of floors, residential buildings are divided into two main groups: visa-free (1-5 storey) and elevator (6-16 storey and above) residential buildings.

1. Low-rise buildings have 1-2 floors, and these houses will be distributed mainly in rural areas. Houses of this type, not only in villages, but also in cities, have not lost their importance at the present time.

2. Medium-rise houses have 3-5 floors and consist of residential buildings with a common staircase, but without an elevator. Such dwellings are very common in cities, where they are considered economically advantageous in construction. Apartment buildings have 6-9 floors and, in addition to the common stairs, must have elevators for their vertical connections. From the point of view of the economics of construction, houses are more expensive than medium-rise houses, but they allow you to accommodate more residents at ground level. Therefore, houses of this type are the main residential buildings for large cities.

References

Abdiyev, H. J. (2022). The Importance Of Furniture In The Interior Of Preschool Institutions. *British Journal Of Global Ecology And Sustainable Development*, *5*, 94–96. Https://Journalzone.Org/Index.Php/Bjgesd/Article/View/73

Abdiyev, H. J., & Tashmatova, X. S. (2022). Maktabgacha Ta'lim Tashkiloti Binosining Interyerida Mebelni Loyihalashning Zamonaviy Usullari. *Arxitektura Dizayni Jurnali*, *7*, 4–7. Https://Geniusjournals.Org/Index.Php/Jad/Article/View/1666

Abdujabbarova, M. T. (2018). *Design Of Residential Buildings:Tutorial 284*. Taqi.

Bertoldi, P. (2021). How To Finance Energy Renovation Of Residential Buildings: Review Of Current And Emerging Financing Instruments In The Eu. *Wiley Interdisciplinary Reviews: Energy And Environment*, *10*(1). Https://Doi.Org/10.1002/Wene.384

Dolce, M. (2021). Seismic Risk Assessment Of Residential Buildings In Italy. *Bulletin Of Earthquake Engineering*, *19*(8), 2999–3032. Https://Doi.Org/10.1007/S10518-020-01009-5

Huo, T. (2021). Dynamic Scenario Simulations Of Carbon Emission Peak In China's City-Scale Urban Residential Building Sector Through 2050. *Energy Policy*, *159*. Https://Doi.Org/10.1016/J.Enpol.2021.112612

Huo, T. (2021). Nonlinear Influence Of Urbanization On China's Urban Residential Building Carbon Emissions: New Evidence From Panel Threshold Model. *Science Of The Total Environment*, *772*. Https://Doi.Org/10.1016/J.Scitotenv.2021.145058

Huo, T. (2022). Carbon Emissions In China's Urban Residential Building Sector Through 2060: A Dynamic Scenario Simulation. *Energy*, *254*. Https://Doi.Org/10.1016/J.Energy.2022.124395

Imran. (2022). Iot Task Management Mechanism Based On Predictive Optimization For Efficient Energy Consumption In Smart Residential Buildings. *Energy And Buildings*, *257*. Https://Doi.Org/10.1016/J.Enbuild.2021.111762

Kadirova, S. A., & Abdujabbarova, M. T. (2019). *Proektirovanie Jilix I Obtshestvennix Zdani: Uchebnoe Posobie*. Organization.

Krarti, M. (2021). Review Analysis Of Covid-19 Impact On Electricity Demand For Residential Buildings. *Renewable And Sustainable Energy Reviews*, *143*. Https://Doi.Org/10.1016/J.Rser.2021.110888

Li, H. (2021). Energy Flexibility Of Residential Buildings: A Systematic Review Of Characterization And Quantification Methods And Applications. *Advances In Applied Energy*, *3*. Https://Doi.Org/10.1016/J.Adapen.2021.100054

Mannan, M. (2021). Indoor Air Quality In Buildings: A Comprehensive Review On The Factors Influencing Air Pollution In Residential And Commercial Structure. *International Journal Of Environmental Research And Public Health*, *18*(6), 1–24. Https://Doi.Org/10.3390/Ijerph18063276

Obaydullaev, X. M., & Inagamova, M. M. (2005). *Tipologicheskie Osnovi Proektirovaniya Jilix I Obtshestvennix Zdani: Uchebnoe Posobie*. Preemnik-Izd-Vo.

Olu-Ajayi, R. (2022). Building Energy Consumption Prediction For Residential Buildings Using Deep Learning And Other Machine Learning Techniques. *Journal Of Building Engineering*, *45*. Https://Doi.Org/10.1016/J.Jobe.2021.103406

Pauliuk, S. (2021). Global Scenarios Of Resource And Emission Savings From Material Efficiency In Residential Buildings And Cars. *Nature Communications*, *12*(1). Https://Doi.Org/10.1038/S41467-021-25300-4

Rosti, A. (2021). Empirical Fragility Curves For Italian Residential Rc Buildings. *Bulletin Of Earthquake Engineering*, *19*(8), 3165–3183. Https://Doi.Org/10.1007/S10518-020-00971-4

Sidikovna, T. X., & Erkinovna, K. M. (2023). Metody Proektirovaniya Detskix Doshkolnyx Organizatsiy V Gorodskix I Selskix Rayonax. *Central Asian Journal Of Sanat Va Dizayn*, *4*(3), 49–52. Https://Doi.Org/10.17605/Osf.Io/Jxdch

Sidykovna, T. K. (2023). Methods Of Designing Preschool Organizations In Urban And Rural Areas. *Nexus: Journal Of Advances Studies Of Engineering Science*, *2*(6), 56–59. Https://Innosci.Org/Jises/Article/View/1456

Wang, P. (2022). An Integrated Technical, Economic, And Environmental Framework For Evaluating The Rooftop Photovoltaic Potential Of Old Residential Buildings. *Journal Of Environmental Management*, *317*. Https://Doi.Org/10.1016/J.Jenvman.2022.115296

Wei, W. (2021). Residential Net-Zero Energy Buildings: Review And Perspective. *Renewable And Sustainable Energy Reviews*, *142*. Https://Doi.Org/10.1016/J.Rser.2021.110859

Xu, Y. (2022). Prediction And Optimization Of Heating And Cooling Loads In A Residential Building Based On Multi-Layer Perceptron Neural Network And Different Optimization Algorithms. *Energy*, *240*. Https://Doi.Org/10.1016/J.Energy.2021.122692

Yan, R. (2022). Decarbonizing Residential Buildings In The Developing World: Historical Cases From China. *Science Of The Total Environment*, *847*. Https://Doi.Org/10.1016/J.Scitotenv.2022.157679

Yuldasheva, M. K., & Kamilova, M. (2023). Foreign Experience In The Design And Construction Of Innovative Architecture Of Museums Of The World. *Central Asian Journal Of Arts And Design*, 320–326.

Zhong, X. (2021). Global Greenhouse Gas Emissions From Residential And Commercial Building Materials And Mitigation Strategies To 2060. *Nature Communications*, *12*(1). Https://Doi.Org/10.1038/S41467-021-26212-Z